

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PCT-UB0302	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP2003/007740	International filing date (day/month/year) 18 June 2003 (18.06.2003)	Priority date (day/month/year) 19 June 2002 (19.06.2002)
International Patent Classification (IPC) or national classification and IPC H01B 1/06, 13/00		
Applicant UBE INDUSTRIES, LTD.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.  
☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 22 October 2003 (22.10.2003)	Date of completion of this report 09 July 2004 (09.07.2004)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP2003/007740

## I. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☐ the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the claims:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the drawings:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-22	YES
	Claims		NO
Inventive step (IS)	Claims	5, 21-22	YES
	Claims	1-4, 6-16, 17-18, 19-20	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims		NO

2. Citations and explanations.

Document 1: WO, 01/86748, A1 (Yuasa Corp., & The Kansai Electric Power Co., Inc.), 15 November 2001, Claims; page 11, line 10 to page 12, line; page 16, line 10 to page 12, line 19; page 16, line 13 to page 17, line 12; page 21, line 5 to page 22, line 11; Fig. 1.

Document 2: JP, 6-287336, A (Toshiba Corp.), 11 October, 1994.

Document 3: JP, 2000-182672, A (Japan Storage Battery Co., Ltd.), 30 June, 2000.

Document 4: JP, 7-37604, A (Canon, Inc.), 07 February, 1995.

Document 5: JP, 2000-154273, A (Matsushita Electric Industries Co., Ltd.), 06 June, 2000, Claims, Par. Nos. [0031] – [0037].

Document 6: JP, 2001-330968, A (Japan Nuclear Power Institute), 30 November, 2001, Full text.

Document 7: JP, 2002-3478, A (Science and Technology Promotion Agency), 09 January 2002.

The inventions of claims 1-4, 6, 11, 14-16 do not appear to involve an inventive step based on the documents 1 – 2 cited in the ISR. A polyelectrolyte membrane comprising a molten salt or a mixture of a polymer and a molten salt on both surfaces and inside a polyelectrolyte membrane, as described in Document 1, wherein a polymer microporous membrane for a polyelectrolyte membrane, which is well known, as described in document 2, and has through fine pores on both sides is used as a polymer microporous membrane is obvious to a person skilled in the art.

The inventions of claims 7, 9 do not appear to involve an inventive step based on documents 1-3 cited in the ISR. As described in document 3, employing a polymer microporous membrane in the form of a microporous membrane composed of a heat-resistant polyimide that has a glass transition temperature of less than 100°C is a well known technological matter.

The invention of claim 8 does not appear to involve an inventive step based on documents 1-4 cited in the ISR. As described in document 4, the existence of aromatic polyimides and heat-resistant polyimides is a well-known technological matter.

The invention of claim 10 does not appear to involve an inventive step based on documents 1-4 cited in the ISR and newly cited documents 5-6. As set forth in the examples in documents 5-6, using 3,3'-dihydroxy-4,4'-diaminobiphenyl as a diamine component of polyimide is a well-known technological matter.

## Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of Box V. 2:

The inventions of claims 12-13 does not appear to involve an inventive step based on documents 1-2, 7 cited in the ISR. Using a polymer containing an anion-exchange group, such as a sulphonic acid group, as a polymer for mixing with a molten salt as described in document 7 is a well-known technological matter. Furthermore, using a polymer containing an anion-exchange group, such as a sulphonic acid group, as a polymer for mixing with a molten salt when a polymer microporous membrane for a polyelectrolyte membrane, which is well known as described in document 2 and has through fine pores on both sides, is employed as a polymer microporous membrane in a polyelectrolyte membrane comprising a mixture of a polymer and a molten salt in a polymer microporous membrane, as described in Document 1, is obvious to a person skilled in the art.

The inventions of claims 17-18 do not appear to involve an inventive step based on documents 1-2 cited in the ISR. Using a polymer microporous membrane for a polyelectrolyte membrane, which is well known as described in document 2 and has through fine pores on both sides, as a polymer microporous membrane in the method for the manufacture of a polyelectrolyte membrane in which a molten salt is impregnated into the pores in a polymer microporous membrane by dipping the polymer microporous membrane into the molten salt, as described in document 1, is obvious to a person skilled in the art. Furthermore, conducting evacuation and degassing or applying pressure in the impregnation of the molten salt into the pores of the polymer microporous membrane is also obvious to a person skilled in the art.

The inventions of claims 19-20 do not appear to involve an inventive step based on documents 1-2, 7 cited in the ISR. Employing a method for the manufacture of a polyelectrolyte membrane in which a molten salt is impregnated into the pores in a polymer microporous membrane by dipping the polymer microporous membrane into the molten salt, as described in document 1, as the method for the manufacture of a polyelectrolyte membrane in which a mixture of a polymer and molten salt is impregnated into the pores in a polymer microporous membrane, employing a polymer microporous membrane for a polyelectrolyte membrane, which is well known as described in document 2 and has through fine pores on both sides, as a polymer microporous membrane in the impregnation of a polymer microporous membrane with a polymer and a molten salt, and employing a solution in which the mixture of the polymer and molten salt is dissolved, which is well known from document 7, as the mixture of the polymer and molten salt are obvious to a person skilled in the art. Furthermore, conducting evacuation and degassing or applying pressure in the impregnation of the mixture of the polymer and molten salt into the pores of the polymer microporous membrane is also obvious to a person skilled in the art.

Novelty and inventive step of the inventions of claim 5, 21-22 cannot be denied by the documents cited in the ISR. None of the documents cited in the ISR describe or suggest a polyelectrolyte membrane, as well as a production method therefor, in which a molten salt is impregnated into the pores of a polymer microporous membrane, layers composed of a mixture containing a polymer and the molten salt at a weight ratio of 1/99 to 99/1 cover both surfaces of the polymer microporous membrane, and a method for the manufacture of such a polyelectrolyte membrane.